# THE INSTITUTE OF PHYSICS

47 BELGRAVE SQUARE, LONDON, S.W.1

# BULLETIN

No. 29 *Information in this circular is not intended for general publication: your copy should not therefore be passed to a library.* MAY 1952


## NOTICES TO MEMBERS

### The Scientific Education of Physicists

The Education Committee's new report, "The Scientific Education of Physicists," is now available. The price to non-members is two shillings, but members of all grades may obtain one copy each, for their personal use, free of charge on application to the Secretary. The report includes, as appendices, facts relating to the physics departments of all the universities and university colleges of Great Britain and Northern Ireland, and of those technical colleges recognized by the Institute. The information should be of value to those studying for a degree in physics or contemplating such a course of study as well as to others who have a close interest in the facilities for advanced training in physics.

### Vacation Posts for Students

The Institute has circulated details of available vacation posts in industrial and other laboratories to professors of physics and heads of technical college physics departments with a request that student members of the Institute be given preference in applying for these vacancies. Students who wish to obtain a post during the summer vacation should, therefore, consult their professor or head of department.

### Changes of Branch and Group Officers

*Manchester and District Branch*—Dr. C. C. Butler (Associate), Physics Department, The University, Manchester, has succeeded Dr. A. Hargreaves as Honorary Secretary.

*Education Group*—Mr. F. Y. Poynton (Fellow), Northampton Polytechnic, St. John Street, London, E.C.1, has succeeded Dr. J. Topping as Honorary Secretary.

*Electronics Group*—Mr. G. W. Warren (Fellow), who has been Honorary Secretary for five years has now succeeded Mr. H. G. Hughes as Chairman. The new Honorary Secretary of the Group is Mr. S. Rodda (Fellow), Edison Swan Electric Co. Ltd., Cosmos Works, Brimsdown, Enfield, Middlesex.

*Electron Microscopy Group*—Dr. R. Reed, Department of Leather Industries, The University, Leeds, 2, has now become Honorary Secretary in the place of Mr. F. W. Cuckow.

*X-Ray Analysis Group*—Dr. E. J. W. Whittaker (Associate), Ferodo Ltd., Chapel-en-le-Frith, Stockport, Cheshire, has succeeded Mr. A. E. de Barr as Honorary Secretary.

### Third International Spectroscopy Colloquium

The Third International Spectroscopy Colloquium which is being arranged by the Institute's Industrial Spectroscopy Group is to be held at High Leigh, Hoddesdon, Hertfordshire, from Monday, September 1st, until the evening of Wednesday, September 3rd, 1952. Residential accommodation is available at High Leigh for about 125 persons and meals can be provided for a small number of non-residents. The house is set in its own spacious, attractive grounds and may be reached from London by rail in just over an hour. Enrolment forms are available on application to the Secretary of the Institute and should be returned as soon as possible. A large number of overseas visitors are expected. The Honorary Colloquium Secretary is Mr. E. van Someren, F.Inst.P. Correspondence concerning the scientific side of the Colloquium should be sent to him at the Institute's address.

### Fourth Industrial Physics Conference

Wide interest has been aroused in the fourth Industrial Physics Conference which the Institute is holding in Glasgow on June 24–28 next, and of which full details have been circulated to members. A large attendance of members and non-members is assured. There has been a particularly good response to the invitations to take part in the exhibition which has been arranged in conjunction with the Conference; seventy-five firms and government departments have taken stands. This will be one of the largest displays of scientific instruments and equipment to have been held in Scotland. Copies of the exhibition catalogue will be available in advance, price 1s. 3d. post free.

### Summer Schools in Crystallography

The University of Leeds has arranged three Summer Schools in crystallography during 1952. These are (1) X-ray Crystallography (25th August to 5th September), (2) Optical Crystallographic Methods (25th August to 5th September), (3) Advanced Techniques of Crystal Structure Analysis (8th September to 12th September).

Courses (1) and (2) cannot be taken concurrently. Course (3) is not a direct continuation of Course (1) and it is unlikely that a student with little or no knowledge of X-ray crystallography who takes Course (1) would benefit by attempting the much more advanced work of Course (3).

The tuition fees and, in brackets, the additional fees for residence, are: Course (1) fifteen guineas (ten guineas), Course (2) fifteen guineas (ten guineas), and Course (3) six guineas (four guineas).

The number of students in the schools will be limited. Application should be made immediately to Miss M. Spink, Assistant to the Director of Extra-Mural Studies, The University, Leeds, 2.

### Summer School in Automatic Computing

A Summer School in programme design for automatic digital computing machines will be held in the University Mathematical Laboratory at Cambridge from 16th to 26th September, 1952. A detailed syllabus and form of application for admission may be obtained from Mr. G. F. Hickson, Secretary of the Board of Extra-Mural Studies, Stuart House, Cambridge, to whom the completed application form should be returned not later than 14th July, 1952.

## SOME ASPECTS OF THE PATENT SYSTEM

*The following article consists of extracts from a talk given by Mr. F. S. Peachey, of the Patent Department of The General Electric Company Limited, to the Midland Branch of the Institute on the occasion of a visit to The General Electric Company's Development Laboratory at Witton. The title of Mr. Peachey's talk was "Patents as they affect development." At the same meeting Dr. W. Wilson gave a talk on the organization of a development laboratory; extracts from Dr. Wilson's address will be published in a later issue of the* BULLETIN.

The British patent system is some hundreds of years old and has been adopted in its essential principles in most other countries of the world. Time has proved the usefulness of a patent system in any industrial country and, under the British system, invention has been encouraged and has grown with the expansion of industry. The fundamental idea of a patent system is the recognition of a proprietary right for a limited period in the technical creation of an inventor's mind, whether it be a new product or a new process, and by virtue of, and in order to obtain, this right, the inventor is required to publish full details of his creation. This publication is a consideration for the grant of the monopoly. The public therefore obtains, at the start of the limited monopoly period, new technical information upon which they may plan and build, and, were it not for the monopoly granted, the inventor might keep his technical creation to himself and thereby deprive the public of useful technical knowledge. There is, of course, still the tendency to keep processes such as chemical processes secret, but since absolute secrecy is almost impossible, it is generally better to patent and publish.

Letters patent mean "open letters," that is—not sealed up, and they used to have the Great Seal; now and since 1883 the seal of the Patent Office is used. Letters patent are addressed by the Crown in this country to all subjects and are a common form of making grants, privileges, etc., including monopolies in inventions. There was considerable abuse of the practice in England during the 16th century and in 1623 the now famous Statute of Monopolies Act was passed to abolish all old monopolies with the exception of those for new manufactures. Section 6 of the Statute of Monopolies authorizes "letters patent and grants of privilege for the term of fourteen years or under, hereinafter to be made, of the sole working or making of any manner of new manufactures within this Realm, to the true and first inventor of such manufactures, which others at the time of making such letters patent shall not use." This Section 6 is the foundation of present patent law in the United Kingdom, and various Patent Acts have been passed since 1623, the most recent being the 1949 Act which came into force on 1 January, 1950.

To the "private" inventor, that is the inventor not employed by a firm to design and invent, who seeks by inventing some new product or process to reap a reward in the way that the inventor of the crinkled hair-pin enriched himself, the monopoly and profit obtained thereby is usually the spur. Despite the increase of what one might call "industrial inventions," year after year thousands of patent applications are filed on simple gadgets and everyday articles, the inventors trying and, in some cases, succeeding, in either making and marketing the gadgets themselves at a handsome profit or disposing of their right to manufacturers on a royalty or lump sum basis. Many such applications fall by the wayside, of course, but for the many that do, there are those, considerable in number, which are useful to the community, and which, were it not for the monopoly granted, would in most cases never be marketed and never be available to the public. For some private inventors, inventing can be compared, in a way, with gambling on football pools; one can imagine the inventors always hoping to hit upon a winning "forecast" which will make them rich. It is interesting to note that if a man makes say £20 000 out of his invention during the life of the patent, the Courts in considering extension of term of patents on the ground of insufficient remuneration, usually regard such a sum as quite an adequate reward. Naturally, there have been many patents where the profits during their lives have far exceeded this sum of £20 000, but since extension is not granted if an inventor has had a reasonable profit during the life of the patent and since there are provisions in the Patents Act for the prevention of abuse of monopoly rights, the Crown in granting the monopoly still ensures that the public do not pay too dearly for a new invention.

Private inventors are usually responsible for the rather more fantastic and sometimes amusing inventions. Before the 1932 Patents Act, the British Patent Office used to grant patents for perpetual motion machines and there are quite a number of these patents on record. The Comptroller is now able to refuse applications for such patents on the ground that the subject-matter is contrary to well-established natural laws. Among the amusing patents granted to private inventors may be quoted those on absorbent wrist bands for stopping moisture running down the arms when eating crayfish, a musical toilet roll holder, and a spoon of sweetmeat for use with unpleasant medicines. The multi-filament electric lamp with a selector switch so that when one filament fails another may be switched on, is often being re-invented.

One important point which private inventors do not always appreciate is that applying for patent protection creates a right which they can "sell"; we have often to tell inventors who write to us that they must first apply for patent protection in their own interests before disclosing the invention to manufacturers.

To the research institutions employing designers to invent, patents are essential for the very existence of the institutions. These institutions are quite common in the U.S.A., less so in other countries, and funds for further research and invention are derived from payments received for past inventions, the use of which is licensed under patents.

The same considerations apply to industrial concerns to some extent and to a degree depending on the "make-up" and size of a concern. Clearly, for a company like the G.E.C. with a Development Laboratory at Witton, Research Laboratories at Wembley, and design facilities at almost every works which *in toto* are not inexpensive to run, there must be some safeguard to prevent the results of development work being copied, immediately they are published, by some unscrupulous competitors having no research, development or design facilities and therefore being able to offer equivalent and copied products at a lower price. A sound patent position gives company directors and financial backers the confidence to put money into development and on this guarantee, as it were, of some return for investment of capital, many industries have been built up on basic inventions, and money will always be available to carry on development in industry.

Examples of industries which have been started on basic inventions under the protection of patents are:—

(1) The pneumatic tyre industry
(2) The electric lamp industry.
(3) The safety-razor blade industry.
(4) The vacuum flask industry.
(5) The Bakelite industry.

True basic master patents are, of course, few these days, the majority of patents being "improvement" patents in the different arts; all such patents have, nevertheless, considerable importance and, in some cases, greater importance than basic patents. An improvement greatly cheapening the cost of a product may mean the difference between success or failure of the product on the market.

In any industrial organization, no matter what its size, there is always the possibility that inventions will be made by employees and, clearly, in large companies with development going on all the time, numerous inventions are made. In order that the full benefits of an invention shall flow to a company the company should apply for patent protection and, by obtaining a monopoly in the invention for a limited period, ensure that the invention, if it is a success, shows a return for the money spent on development.

In the G.E.C., the volume of patent work is sufficient to merit running a patent department with a staff of six qualified patent agents and their technical assistants, and the department deals with all aspects of patent work. One of its chief duties is to take out patents both in this country and abroad on inventions made by company employees; another is to steer the company clear of other people's patents.

Each week the patent department buys copies of all British specifications published that week which are of interest to the company and selected abstracts of these specifications are circulated to selected sections of the company. By this means the engineers are kept *au fait* with current developments of others and one of the main purposes of the patent system is achieved, that is, the early dissemination of information about new inventions. The information adds to the store of knowledge of the engineers who are also warned of patents which might be infringed. Very often, invention breeding invention, the sight of abstracts of other people's specifications triggers off a train of inventive thought in an engineer's mind with useful results.

Another service is provided by the patent department when, before embarking on a development programme, the Development Laboratory asks for survey of published patent specifications on a particular subject. Thus, before, say, embarking on a development programme for a new vacuum cleaner, the patent department can provide a set of patent specifications of interest published over the last twenty or thirty years. Such a set not only helps in suggesting lines of development, but also includes any patents in force which might be infringed. The development programme must take such patents into account and, when the programme is completed, any patentable features in the new design will be protected by the patent department to reserve these new features for the company.

Where a new design comes within the scope of an existing patent, then the department advises and suggests ways of modifying the design to avoid infringement if the patent appears to be valid. The question of applying for a licence is also considered if this is a reasonable and practical solution.

It sometimes occurs that the company is asked to produce equipment similar to some already on the market. Obviously, unless the equipment has been well known for many years, it is essential before doing any development or design work, to consider the question of possible patent infringement and patent department carries out searches for the Development Laboratory and other sections of the company if there is a possibility of such infringement.

The patent department also deals with matters relating to the registration of designs and trade marks, these being industrial "rights" similar in some respects to patents, and quite a number of the company's products are protected, as regards their appearance, by registered designs. All products are sold under well-established trade marks, such as G.E.C. and Osram.

Now for a number of general points. Firstly, it is quite common for a company's development work to be based on patents for inventions originating outside its own organization. Thus, a private inventor may offer a useful invention in its prototype or even nebulous stage to a company and the company takes up the finalizing and marketing of the design, with a suitable return to the inventor. Again, many companies have patent exchange and licence agreements with other companies, often overseas, and quite a number of manufactures worked under patents in this country have originated overseas and vice versa. As I said earlier, letters patent create a right transferable in various ways by agreement and, as such, enable companies to work in close co-operation.

That patents are useful in an industrial country is, I think, proved by the fact that company patent departments have increased in number during the last twenty or thirty years. Industry recognizes the need for a patent system and, whereas thirty years ago only one or two companies ran their own patent departments, I should say that nowadays about a quarter of the qualified patent agents in this country are actually in industry. Company patent departments are also popular in the U.S.A. where, because of the rather more complex nature of the U.S. patent system, departments tend to be larger than here. Many continental firms also run their own patent departments.

## APPOINTMENTS VACANT

**The inclusion of particulars of a vacancy must not be taken to imply that the Institute necessarily approves of the terms offered or that might be offered. Candidates should satisfy themselves that these are satisfactory, and they may always refer to the Institute for advice.**

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**Rhodes University**, Grahamstown, South Africa, invite applications for the post of **Lecturer in Physics** from 1st September, 1952.

Salary scale: Men—£550 × 25 — £700 per annum.
Women—£425 × 25 — £575 per annum

plus a variable cost of living allowance, at present about £109 per annum for a single person and £256 per annum for a married person.

Salary scales are at present under review and during 1952 an interim bonus is being paid in addition to the above.

Previous experience and academic qualifications may be taken into account in fixing the initial salary.

Further particulars and information as to the method of application should be obtained from the Secretary, Association of Universities of the British Commonwealth, 5 Gordon Square, London, W.C.1.

The closing date for the receipt of applications is 31 May, 1952.

**Development Engineer.** Vacancy in Design and Development Department for Graduate (or equivalent). Suitable applicants would be those with sound knowledge of engineering, physics or mathematics. Department covers wide range engineering:—analyses and design of mechanism, stress analyses, resonance and analyses of motion, spring design, optical developments, etc., with limited research work. Applications in first instance, addressed Personnel Manager, **Wilmot-Breeden Limited,** Amington Road, Tyseley, Birmingham 25.

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**The Royal Technical College, Glasgow** (in affiliation with the University of Glasgow). **Assistant Lectureship in Natural Philosophy.** Candidates should have a degree in physics or equivalent qualification. Industrial experience an advantage. Opportunities for research. Salary on scale £450 × £25 — £550. Application forms from the Secretary.

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**British Launderers' Research Association.** A vacancy exists for a **Physicist** to work on the application of ultrasonics to detergency. Commencing salary within the range £450–£700 per annum, depending on age and experience. Good prospects, superannuation. Apply with full details, Director, B.L.R.A. Laboratories, Hill View Gardens, Hendon, N.W.4.

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**A.E.I. Fundamental Research Laboratory.** Two **physicists** required for fundamental research in solid state physics to work in expanding group on semi-conductors, barrier cells and transistors. Applications, stating age, qualifications and experience should be addressed to the Personnel Officer, Research Laboratory, Associated Electrical Industries Limited, Aldermaston Court, Aldermaston, Berkshire.

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**Imperial Chemical Industries Limited,** Nobel Division, requires **physicists** for election to their Technical Staff to work on applied research connected with manufacture and industrial application of silicones. Applicants should be University honours graduates with good training in electricity in their degree work. Research experience on electrical problems would be an advantage. Salary according to age, qualifications and experience. Applications should be made to the Staff Manager, Nobel House, 25 Bothwell Street, Glasgow, C.2.

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**Research Assistants** are required by the Department of Physics and Mathematics, **College of Technology, Birmingham,** for a range of work on electronics, with particular reference to the performance and characteristics of thermionic valves and associated equipment. One appointment in mathematics may be made outside this field. Candidates must have a good honours degree in physics and/or mathematics, and preferably should be graduates of a University which awards higher degrees for external study. There will be a small amount of teaching duty attached to the posts. The appointments will be for a maximum of three years.

Salaries will be in accordance with the Burnham (Further Education) Scale, Assistant Grade A, i.e. (for men) commencing at £375 per annum with additional graduate and training allowances where applicable. In fixing the commencing salary, allowance will be made for teaching, and approved industrial experience.

Further particulars and form of application may be obtained from the Registrar of Technology, Suffolk Street, Birmingham 1, on receipt of stamped addressed foolscap envelope. Completed forms should be returned to him not later than 24 May, 1952.

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**Two graduates,** one senior, one junior, required for work in Electronics Section of laboratory engaged in Physics Research. The function of the Electronics Section is primarily to design and build control and measuring gear for the laboratory, including Sections working on Electron Microscopy, Nuclear Physics, Semi-Conductors and Physical Metallurgy.

Two other posts are vacant for work on new project requiring men with Ph.D. or honours degree and at least two years post-graduate experience and having interest in work on radio frequency power circuits.

Applications in writing stating age, qualifications and experience to Personnel Officer, **Associated Electrical Industries Limited,** Research Laboratory, Aldermaston Court, Aldermaston, Berkshire.

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Opportunity occurs for young **physicist** with 1st or 2nd class honours and interest in practical electronics and more theoretical aspects of physics, to work on a project the results of which will be available for use as a higher degree thesis. Apply to Dr. A. D. Booth, Director, Birkbeck College Electronic Computer Project, 21 Torrington Square, London, W.C.1.

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**University Graduates** or men with equivalent qualifications required for the following vacancies in the Technical Division of a large modern paper mill.

1. **Chemist, physicist** or **chemical engineer** for work mainly on technical control and development of plant.

2. **Chemist, physicist** or **chemical engineer** for research development and general investigation work on papermaking and allied processes.

3. **Physicist** or **physical chemist** for research, development and general investigation work, mainly concerned with pulp, papermaking and allied processes.

Applications considered from men who expect to graduate this year. Experience of the paper industry not essential. Salary according to age and experience. Applicants should have completed or be exempt from National Service.

Letters of application must state (*a*) vacancy number; (*b*) age; (*c*) qualifications; (*d*) whether married or single, and should be addressed to Chief of Technical Division, **Albert E. Reed and Co. Ltd.,** Aylesford Paper Mills, Larkfield, Kent.

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Applications are invited for the vacant post of **Senior Lecturer in Physics, University of Hong Kong,** a post occasioned by expansion to the present establishment.

Emoluments (for a married member of the staff normally resident outside Hong Kong or China, and inclusive of allowances): £1 576 × £40 — £1 736 per annum.

Applicants should be graduates of British Universities and have appropriate qualifications and experience and should be prepared to take up the post by September, 1952.

First-class sea passages and furnished houses or flats at reasonable rentals are provided for expatriate staff.

Further particulars and information as to the method of application should be obtained from the Secretary, Association of Universities of the British Commonwealth, 5 Gordon Square, London, W.C.1. The closing date for the receipt of applications is 31 May, 1952.

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An **Engineer** or **Physicist** is required for development work in methods of non-destructive testing and for the design, construction and maintenance of instruments for use in research. Preference will be given to candidates with good experience in electronics. The post carries superannuation. Application, stating salary required, should be sent to The Director of Research, **Aluminium Laboratories Limited,** Banbury, Oxon.

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One or more **Physicists** or **Electrical Engineers** are required by the **Electrical Research Association** for investigations on electrical breakdown in dielectrics. Starting salary will be in the range of £450–£700 per annum, with Superannuation, after a probationary period, under F.S.S.U. rules. Applications from students expecting to graduate during the summer would be considered. Applications should be made to the Director, E.R.A. Laboratory, 5 Wadsworth Road, Greenford, Middlesex.

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**Graduate Chemist** or **Physicist** required by the **British Iron and Steel Research Association** for slagrefactory problems in connection with iron and steel making. Experience of high temperature research an advantage. Age 23–27. Salary according to age, qualifications and experience. Location of work, London. Written applications only, quoting "Slags," to Personnel Officer, B.I.S.R.A., 11 Park Lane, London, W.1.

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Honours Graduates in physics, with or without industrial experience, are required for research in the ceramic industry. The posts, which are permanent and progressive, are in the Scientific Officer (Salary range £400–£625) and Senior Scientific Officer (Salary range £650–£950) grades, and carry superannuation under F.S.S.U. Applications, giving full details of age, qualifications and experience to Director of Research, **British Ceramic Research Association,** Queens Road, Penkhull, Stoke-on-Trent.

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